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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/905,349 | 07/13/2001 | Jay Brian DeDontney | A-67178-1/MSS | 7344 |

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| EXAMINER |
|---|
| ZERVIGON, RUDY |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1763 | |

DATE MAILED: 08/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) |
|---|---|---|
| | 09/905,349 | DEDONTNEY ET AL. |
| | Examiner | Art Unit |
| | Rudy Zervigon | 1763 |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *06 June 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1-5, 8, and 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soichiro Kawakami (JP61037969) in view of Ohashi (JP10-177960)[1]. Soichiro Kawakami teaches a gas delivery metering tube (Figure 1) for delivering a gas in a plasma CVD process comprising:

i. an outer tube (3) having an inlet end (4/3 interface) and a closed end (opposite end), and one or more arrays of orifices (15) formed in the outer tube (3) and extending along the substantial length of the outer tube (3); an inner tube (5) having open inlet (4/5 interface) and outlet (opposite 4/5 interface) ends, the inner tube (5) being nested and axially aligned inside of the outer tube (3) forming an effective annular space (20) there between, and wherein the outlet end of the inner tube (5) terminates prior to the closed end (opposite end) of the outer tube (3).

Soichiro Kawakami further teaches the gas delivery metering tube further comprising a single gas supply port (inherent, feeding item 5, Figure 1) coupled to the inlet end (at cut away of item 5) of the inner tube (5) for supplying gas to the metering tube.

Soichiro Kawakami does not teach:

[1] Machine translation from http://www1.ipdl.jpo.go.jp

i. a gas flow divider positioned adjacent the inlet ends of the inner and outer tubes and having a first gas flow path coupled to the inner tube (5) and a second gas flow path coupled to the annular space (20) between the inner and outer tubes.

ii. a gas delivery metering tube wherein the cross sectional area of the inside of the inner tube (5) is approximately equal to the total cross sectional area of the plurality of small orifices in a flow divider.

Ohashi teaches a fluid flow divider (upper portion of 41, Figure 4) having a first flow path ("Sz") and a second gas flow path (Sx) coupled to an annular space (Sx). Ohashi further teaches the fluid flow divider being a disk (Figure 4) having a central orifice (17a) forming the first gas flow path and a plurality of small orifices (17b) forming the second gas flow path.

Ohashi further teaches a gas flow divider (upper portion of 61, Figure 6) which comprises a flange (see L shape of U/21 face, Figure 6) on the inlet end of the inner tube (21, Figure 6), the flange having a lip (20, Figure 6) containing a plurality of small orifices (20a, Figure 6) forming the second gas flow path.

It would have been obvious to one of ordinary skill in that art at the time the invention was made to replace Soichiro Kawakami's support plate with Ohashi's fluid flow divider such that it is positioned adjacent the inlet ends of Soichiro Kawakami's inner and outer tubes and having a first gas flow path coupled to Soichiro Kawakami's inner tube and a second gas flow path coupled to Soichiro Kawakami's annular space between the inner and outer tubes.

Motivation to replace Soichiro Kawakami's support plate with Ohashi's fluid flow divider such that it is positioned adjacent the inlet ends of Soichiro Kawakami's inner and outer tubes and having a first gas flow path coupled to Soichiro Kawakami's inner tube and a second gas flow path coupled to Soichiro Kawakami's annular space between the inner and outer tubes is to distribute the delivered gas to both the inner and outer tubes.

It would have been obvious to one of ordinary skill in that art at the time the invention was made to dimension Soichiro Kawakami's gas delivery metering tube wherein the cross sectional area of the inside of the inner tube (5) is approximately equal to the total cross sectional area of the plurality of small orifices (15) in the flow divider.

Motivation to dimension Soichiro Kawakami's gas delivery metering tube wherein the cross sectional area of the inside of the inner tube is approximately equal to the total cross sectional area of the plurality of small orifices in the flow divider is to provide for the desired pressure gradient. Further, it is well established that changes in apparatus dimensions are within the level of ordinary skill in the art.(Gardner v. TEC Systems, Inc. , 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied , 469 U.S. 830, 225 USPQ 232 (1984); In re Rose , 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04)

3. Claims 6 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soichiro Kawakami (JP61037969) and Ohashi (JP10-177960) in view of Ishii (USPat. 5,685,942).

Soichiro Kawakami and Ohashi are discussed above. Soichiro Kawakami and Ohashi do not teach:

i. a gas supply port comprising a block having a pocket formed therein, the pocket being sealed with a cover to create a confined passage, and a gas supply connector coupled to the pocket for receiving a gas and a hollow tube assembly coupled to the pocket and the inlet end (4/3 interface) of the inner and outer tube (3)s for conveying the gas.

Ishii teaches gas delivery system (91, 89, 85; Figure 4) for a wafer processing apparatus (column 3, lines 37-49). Specifically, Ishii teaches:

ii. a gas supply port (91; column 8, lines 16-22) comprising a pipe {block} having a pocket (conduit volume) formed therein, the pocket being sealed with a cover (pipe 91) to create a confined passage (conduit volume), and a gas supply connector (92) coupled to the pocket for receiving a gas and a hollow tube (89) assembly coupled to the pocket

It would have been obvious to one of ordinary skill in that art at the time the invention was made to replace the gas conduit of Soichiro Kawakami and Ohashi with Ishii's gas supply port comprising a block instead of a pipe shape.

Motivation to replace the gas conduit of Soichiro Kawakami and Ohashi with Ishii's gas supply port comprising a block instead of a pipe shape is to provide an alternate and equivalent means for process gas delivery. Additionally, it has been established that the shape of a container is a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed container is significant (In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966); MPEP 2144.04).

4. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Soichiro Kawakami (JP61037969) and Ohashi (JP10-177960) in view of Lemp (USPat. 4,836,246). Soichiro Kawakami and Ohashi are discussed above. However Soichiro Kawakami and Ohashi do not teach one or more standoff spacers attached to the inner tube to axially align the inner tube inside the outer tube.

Lemp teaches a similar gas distribution arrangement (Figure 1; column 2, lines 24-40). Specifically, Lemp teaches a standoff spacer (16, Figure 1) attached to the inner tube (32) to axially align the inner tube (32) inside the outer tube (12).

It would have been obvious to one of ordinary skill in that art at the time the invention was made to add a standoff spacer attached to the inner tube to axially align the inner tube inside the outer tube in the Soichiro Kawakami and Ohashi apparatus as taught by Lemp.

Motivation to add a standoff spacer attached to the inner tube to axially align the inner tube inside the outer tube in the Soichiro Kawakami and Ohashi apparatus as taught by Lemp is to support the inner and outer tubes (column 2, lines 35-40).

5. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Soichiro Kawakami (JP61037969) and Ohashi (JP10-177960) in view of DeDontney, Jay B. et al (USPat. 5,849,088). Soichiro Kawakami and Ohashi are discussed above. Soichiro Kawakami and Ohashi do not teach at least one injector assembly having at least one port for receiving the gas delivery metering tube. Soichiro Kawakami and Ohashi do not teach at least one shield assembly having at least one plenum for receiving the gas delivery metering tube.

DeDontney teaches a similar gas delivery system (Figure 3; column 5, line 61 – column 6, line 34). Specifically, DeDontney teaches an injector (14, Figure 3) and at least one shield assembly (40c,d; Figure 4) having at least one plenum (78) for a gas delivery metering tube (80).

It would have been obvious to one of ordinary skill in that art at the time the invention was made to provide a port in DeDontney's injector assembly for Soichiro Kawakami' and Ohashi's gas delivery metering tube including replacing DeDontney's gas delivery metering tube with Soichiro Kawakami's and Ohashi's gas delivery metering tube.

Motivation to provide a port in DeDontney's injector assembly for Soichiro Kawakami' and Ohashi's gas delivery metering tube including replacing DeDontney's gas delivery metering tube with Soichiro Kawakami's and Ohashi's gas delivery metering tube is to distribute process gas as taught by Soichiro Kawakami.

***Response to Arguments***

6. Applicant's arguments filed June 6, 2003 have been fully considered but they are not persuasive.

7. Applicant believes "the description of the figures and disclosure of Ohashi et al provided by the Examiner in the March 3, 2003 Office Action appear to be directed toward U.S. Patent No. 6,059,885 to Ohashi et al". Applicant is in error. All Ohashi citations made by the Examiner in the March 3, 2003 Office Action are solely directed to Figures 4 and 6 of Japanese Publication No. 10-177960. To assist Applicant, the Examiner included in the prior action a machine translation of Japanese Publication No. 10-177960. Applicant is urged to argue only references that are applied against the claims at issue. U.S. Patent No. 6,059,885 was not applied against the claims at issue in the last Office Action.

Figure 4 of Applicant's reference of U.S. Patent No. 6,059,885 to Ohashi is identical to the Examiner's applied reference of Japanese Publication No. 10-177960. Applicant's response to Figure 4 then should coincide with the Examiner's citation, however, Applicant states that the Examiner's cited items of substrate 41 and support 42 as meeting applicant's "fluid flow divider". However, the Examiner clearly made his position according to Japanese Publication No. 10-177960 and the prior Office Action:

"

Ohashi teaches a fluid flow divider (upper portion of 41, Figure 4) having a first flow path ("Sz") and a second gas flow path (Sx) coupled to an annular space (Sx). Ohashi further teaches the fluid flow divider being a disk (Figure 4) having a central orifice (17a) forming the first gas flow path and a plurality of small orifices (17b) forming the second gas flow path.

Ohashi further teaches a gas flow divider (upper portion of 61, Figure 6) which comprises a flange (see L shape of U/21 face, Figure 6) on the inlet end of the inner tube (21, Figure 6), the flange having a lip (20, Figure 6) containing a plurality of small orifices (20a, Figure 6) forming the second gas flow path.

"

In fact, Japanese Publication No. 10-177960 cites "W" in Figure 4 as the substrate not Applicant's "41" , and item 12 as the substrate support, and not Applicant's "42" as the substrate support. The Examiner does not know what figure Applicant refers to in the Examiner's citation of Japanese Publication No. 10-177960.

With respect to Applicant's position that "the Examiner has alleged that item 4 in Soichiro is "a gas flow divider" ", Applicant is in error. As stated in the prior Office Action:

“

Soichiro Kawakami does not teach:

iii. a gas flow divider positioned adjacent the inlet ends of the inner and outer tubes and having a first gas flow path coupled to the inner tube (5) and a second gas flow path coupled to the annular space (20) between the inner and outer tubes.

iv. a gas delivery metering tube wherein the cross sectional area of the inside of the inner tube (5) is approximately equal to the total cross sectional area of the plurality of small orifices in a flow divider.

“

As such, the Examiner has recognized that Soichiro Kawakami does not teach Applicant’s gas flow divider. Applicant again mistaken’s the Examiner’s position when affirming that the Examiner cites Soichiro for teaching “item 61, which the Examiner asserts may be labeled as a “single gas supply port” ”. Again, as states in the prior Office Action, the Examiner cites a single gas supply port as feeding item 5 in Figure 1 and is thus considered inherent that a gas port feed into a gas supply line.

***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (703) 305-1351. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official after final fax phone number for the 1763 art unit is (703) 872-9311. The official before final fax phone number for the 1763 art unit is (703) 872-9310. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (703) 308-0661. If the examiner can not be reached please contact the examiner's supervisor, Gregory L. Mills, at (703) 308-1633.

JEFFRIE R. LUND
PRIMARY EXAMINER